Communications Research Centre Canada
An Agency of Industry Canada

Centre de recherches sur les communications Canada
Un organisme d'Industrie Canada

*Realizing*
***Innovation***

# Highlights
## 2001-2002

Canada

CRC

# *Chair's Message*

Happy 50th Anniversary Shirleys Bay!

The Shirleys Bay Research Campus – of which CRC is custodian and the largest resident – is celebrating an incredible milestone this year: 50 years as a Canadian innovation leader.

In their past and current forms, CRC and its campus neighbours – the National Defence labs, the Canadian Space Agency and Industry Canada's Certification and Engineering Bureau – have all had a significant impact on the telecommunications sector. One just has to look at some of today's major telecom companies to see the breadth of CRC's impact. Telesat Canada, Motorola Wireless, as well as more than 60 other high-tech companies, all have roots that can be traced back to CRC.

CRC represents a successful national model of research collaboration where the public and private sectors work hand-in-hand for the benefit of Canadians.

With leading-edge capabilities in the technologies and applications that will eventually touch all our lives – among them tele-medicine and tele-education – CRC stands positioned as a leader of our country's commitment to innovation.

Seeing the achievements in research and development in the very latest telecommunications trends that are described in this brochure, it's clear that CRC's long tradition of technology and knowledge transfer will continue well into the future.

To celebrate its future endeavours as well as past successes, CRC and its Shirleys Bay neighbours are planning several events to mark their 50th anniversary. These include an open house in the fall of 2002 that will bring together all those with past or current ties or interest in CRC. Guests will have a chance to go behind the scenes, meet the researchers and see the groundbreaking work that goes on in some of the world's most sophisticated and unique telecommunications laboratories.

We hope you join us for the anniversary events, as we celebrate our heritage and build our future.

Dr. Alan E. Winter

# *President's Message*

The last year has been largely a time of reflection and of planning CRC's future. We've spent time looking at how to use what we've built over the last half-century to forge a path that will continue to bring value to our government, our economy and our fellow citizens.

While our campus's 50th anniversary is a milestone that makes us pause and take a look at who we are and where we are headed, world events over the last year have prompted us to reassess our priorities.

September 11th forever changed the way our government and indeed, all of us, do business. For CRC, it has meant positioning ourselves between two of our largest clients – Industry Canada and National Defence – to deliver the value needed to support the economy and to strengthen our country's capability to protect its people and the values for which our nation stands.

Telecommunications knowledge and technologies have become key to dealing with the realities of our new world as they serve as tools for innovation and economic growth, and security.

In an effort to consolidate our research activity towards ensuring that Canada becomes a country where every citizen has the opportunity to be innovative and participate in the new economy, CRC launched a major R&D program aimed at developing and demonstrating enabling technologies to bring broadband access to all Canadian communities, including remote and rural areas.

To strengthen Canada's innovation potential globally, CRC signed an agreement with the European Commission for a project that will facilitate R&D co-operation between European and Canadian research organizations.

In yet another kind of international collaboration, CRC has aligned itself with the world's top military research organizations to address issues related to security. CRC has taken on a lead role in an eight-nation, NATO-sponsored consortium focused on interoperable, secure military communications.

With examples such as these – and many others – CRC stands well positioned to ensure that our government's goal for a more innovative and secure economy and nation becomes more than rhetoric – but that it becomes reality.

J.G. (Gerry) Turcotte

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# *CRC: A Global Overview*

The Communications Research Centre Canada (CRC), an agency of Industry Canada, is the country's leading laboratory specializing in collaborative research and development (R&D) in advanced telecommunications.

CRC's mission is focused on excellence; on independent advice for shaping public policy; on partnership approaches to closing innovation gaps in the telecommunications sector; on building technical intelligence; and on supporting small and medium-sized high-technology enterprises.

CRC's vision is one of national leadership in collaborative R&D on state-of-the-art telecommunications and information technologies.

**CRC's goal: to help create a stronger, more innovative and competitive economy.**

CRC has built the capacity to anticipate major telecommunications trends, and the technical expertise to recommend concepts that can work within political and economic realities. It has done so by working with all levels of government, and academic and private sectors in Canada and abroad.

CRC has a critical mass of Canada's researchers (more than 200) and facilities dedicated to R&D on the technologies that form the basic telecommunications systems across Canada: *radio, satellite, broadcasting* and *fibre optics*. The focus is to understand how these technologies can work together to form affordable, quality telecommunications networks that can serve all Canadians – no matter where they live or work.

# Highlights

In 2001-2002, CRC continued to emphasize serving its government clients, fostering connectivity and innovation, and delivering industrially relevant R&D to Canada's telecom sector. Following is a sampling of CRC's highlights for the year:

- Major progress on the MILTON system means it will be ready for demonstration in 2002-2003. The system aims to provide homes with high-speed wireless Internet services. It will allow bi-directional access to high-quality video and audio, as well as standard Internet-type data.

- CRC demonstrated how advanced, interactive multimedia communications can work with next-generation satellites, and how they can deliver benefits to Canadians living in remote and rural areas. Tele-health (including tele-psychiatry), tele-learning and tele-justice were just some of the applications tested in remote communities.

- Teachers across Canada have started to benefit from the LearnCanada project, where advanced broadband connections allow teachers interactive access to their colleagues and materials for training and professional development.

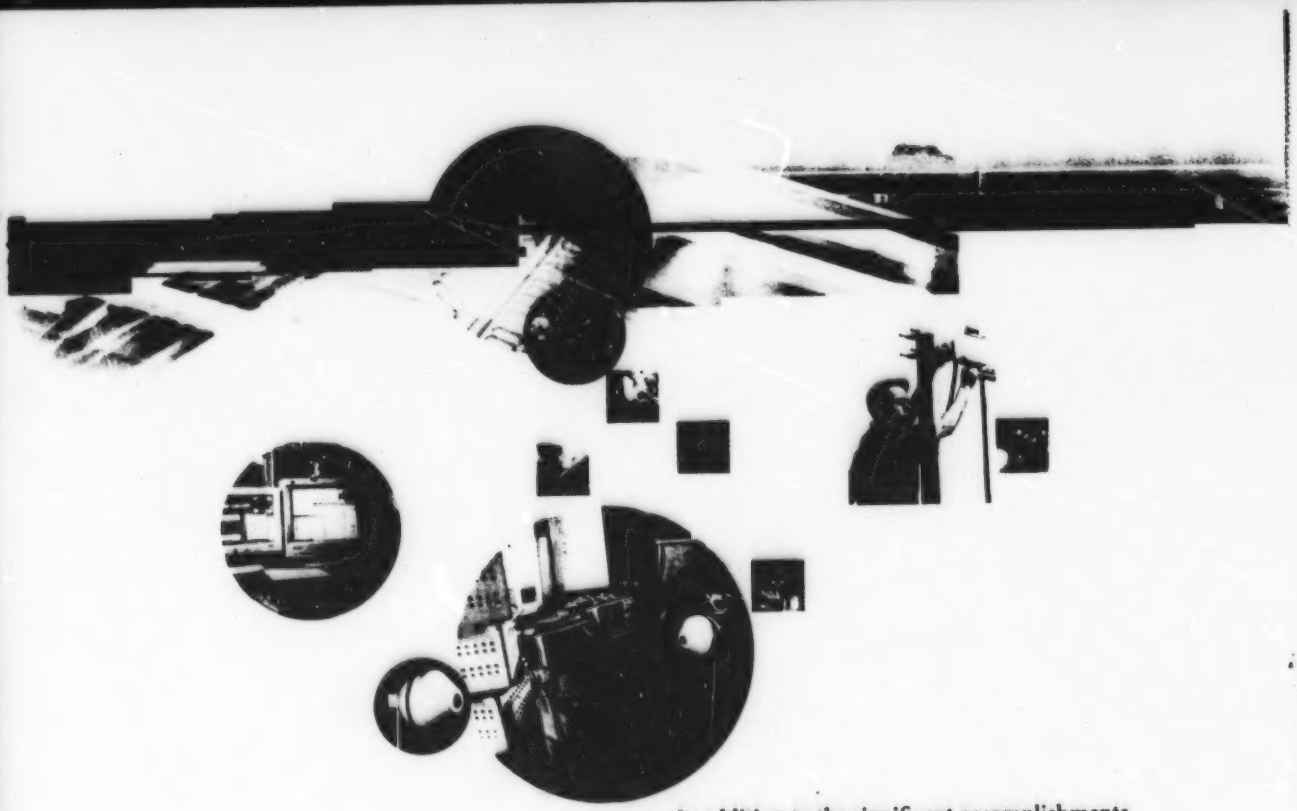
- CRC partnered with the Canadian Microelectronics Corporation to demonstrate how the Internet can be used by researchers in a remote location to access test equipment at CRC. The researchers were able to carry out experiments that previously could have only been done had they been physically in the lab. The demonstration will provide a benchmark when this new way of doing research is applied in Canadian universities.

- The digital age in television, radio and interactive multimedia communications is coming ever closer to widespread deployment thanks to CRC's ongoing, groundbreaking R&D in the field. CRC is recognized worldwide as a leading expert in this cutting-edge technology area.

- A new kind of radio technology called Software Defined Radio (SDR) may help make us all safer. SDRs can be quickly re-programmed in the field so that they become compatible with any radio being used by another organization. This is useful in emergency or disaster situations where you have many different organizations working at the scene who need to communicate with each other. CRC has invented software – available free to the public – that will ensure radio interoperability.

- A number of products, technology transfer and partnership agreements resulted from CRC's R&D in high-speed circuits, antennas and photonics – areas where CRC has demonstrated great promise for telecommunications technologies that will cost less and have increased capabilities.

- CRC partnered with Ottawa's top academic institutes and the National Research Council to form a world-class photonics research alliance. The alliance will pool expertise and resources to generate ideas for the private sector to exploit, which will help make the region more productive and innovative.



- CRC's Broadband Applications and Demonstration Laboratory (BADLAB™) linked several countries, including Canada, to a global summit discussing IPv6 and the Internet of the future. Participants were able to interact in real time and a Canadian IPv6 expert was able to chair one of the summit's sessions virtually.

- CRC's innovative spectrum monitoring technology captured significant interest from the Canadian and U.S. militaries, as well as Industry Canada and a number of Canadian companies, which bought licences for the software.

- CRC is leading two international programs that are exploring how to make military communications more interoperable and secure – aspects crucial to the business of safety and defence.

**In addition to the significant accomplishments of its research groups, CRC undertook several corporate-level initiatives to ensure a thriving research environment:**

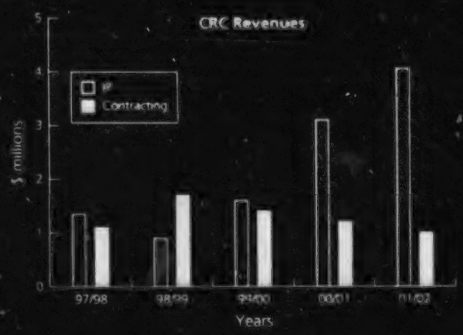
- An agreement struck with Public Works and Government Services Canada will see two new facilities added to the CRC campus: a new Laboratory for Photonics Systems and Components Research; and a unique, state-of-the-art antenna research facility – the construction of which has already begun.

- Several years of negotiation led to an agreement between CRC and technology commercialization giant British Technologies Group (BTG) International. BTG will use its expertise and connections to better market certain CRC technologies in Canada and around the world.

- To ensure that CRC has the research capacity it needs to grow and thrive, the Public Service Commission granted CRC exclusive rights to hire its own research scientists and engineers. This has eased the difficulties and streamlined the processes associated with hiring and dealing with staff turnover in the federal research environment.

# *Financial Report*

CRC posted record gains in the 2001-2002 fiscal year, with Intellectual Property (IP) revenue cresting the $4-million mark for the first time ever. This revenue spike is attributable to the licensing success of the Bragg gratings portfolio, where CRC's cross-licence partner, United Technologies Corporation, concluded several significant agreements in which large up-front fees were split with CRC. In addition, both CRC and its partner continued to collect high royalty yields on licensees' sales of products containing Bragg gratings.

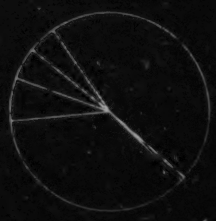



This IP revenue surge is expected to slacken in 2003, based on declining sales projections for 2002, which parallel the general downturn in the telecommunications industry. CRC's IP revenues have steadily increased since 1998 – a reflection, in large part, on the robustness of the fibre optic segment of the telecommunications market.

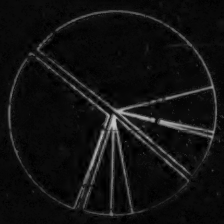
During the five-year period ended March 2002, contracting-in revenues, which are derived from directed research and laboratory services, have remained relatively constant. These revenues peaked in 1998 at $1.7 million, and in this last fiscal year have come in at $1 million – a more sustainable level, given CRC's renewed focus on longer-term research.

CRC receives funding from a number of government and non-government sources. In 2001-2002, Industry Canada provided 46% of CRC's funding. Other government funding was provided by the Canadian Space Agency and the Department of National Defence to carry out R&D, and to cover costs related to their residence on the Shirleys Bay campus. Revenue from the private sector is generated through the licensing of intellectual property and contracted R&D.

| **REVENUE** | ($ millions) |
|---|---|
| Industry Canada | 34.2 |
| Tenant and Support Services | 3.4 |
| Private Sector | 3.9 |
| Department of National Defence | 5.2 |
| Canadian Space Plan | 26.8 |
| Spectrum Research (Industry Canada) | 0.6 |
| TOTAL REVENUE | **74.1** |



| **EXPENSES** | ($ millions) |
|---|---|
| *Research Programs* | |
| CRC Research Program | 22.3 |
| Research performed for National Defence | 5.2 |
| Spectrum Research | 0.6 |
| Research Support | 5.4 |
| *Canadian Space Plan* | |
| Contracts | 26.3 |
| CRC Research | 0.5 |
| Total Research Programs | 60.3 |
| Tenant and Support Services | 3.4 |
| CRC Administration | 2.5 |
| Site Services | 7.9 |
| TOTAL EXPENSES | **74.1** |



# *Board of Directors*

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|---|---|
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| Gerry Turcotte | President<br>Communications Research Centre Canada |


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